CLAIM AMENDMENTS

1. *(currently amended):* **A method** [~~Method~~]for finding the Reflection Coefficient (RC) of reflectors in **illuminated areas of** the subsurface of the ground, [~~said method~~] comprising:

a) migrating to depth recorded traces in a survey by Pre-Stack Depth Migration (PSDM), using shot/receiver pairs, **to obtain** [~~thereby achieving~~] a real depth migrated seismic cube $P_{Obs}(\vec{x})$ which is a function of the recorded traces that have each been given a weight $w_i(\vec{x})$;

b) interpreting $P_{Obs}(\vec{x})$ to find the spatial positions of the reflectors in the subsurface, and based on these reflectors and the seismic velocities, a depth model is established in the computer, **wherein one of the reflector surfaces** [~~and one of the reflectors~~] in the depth model is chosen to be the target reflector;

c) computing synthetic traces from the target reflector for all shot/receiver pairs **by** [~~in the survey that was used in a);~~]

[~~d)~~]setting the RC of the target reflector in the depth model to an essentially constant value when the synthetic traces are computed;

[~~e)~~] **d)**[~~doing~~] **performing** a local PSDM of the **computed** synthetic traces in a band around the target reflector to obtain a modeled **synthetic** PSDM cube $P_{Mod}(\vec{x})$ **locally around the target reflector**; and

[~~f)~~] **e)** measuring the amplitudes along **the** target reflector [~~on~~] **from** the real

PSDM cube $P_{Obs}(\vec{x})$, **and** dividing these **amplitude** measurements by the corresponding **amplitude** measurements from the modeled PSDM cube $P_{Mod}(\vec{x})$, [~~thereby obtaining an estimate~~] **to thereby obtain discrete estimates** of the angle dependent RC **for all illuminated areas of the target reflector** [~~with corresponding reflection angle~~] and **a** weight function **for all discrete estimates of the RC along the target reflector**.

Claims 2 to 6 *(cancelled)*

7.(*currently amended*): An article of manufacture comprising:

- a computer usable medium having computer readable program code embodied therein for finding the Reflection Coefficient (RC) of reflectors in **illuminated areas of** the subsurface, the computer readable program code in said article of manufacture comprising:

a) computer program means for enabling a computer to determine depth recorded traces in a survey by Pre-Stack Depth Migration (PSDM), using shot/receiver pairs, [~~thereby achieving~~] **to obtain** a real depth migrated seismic cube [~~(~~] $P_{Obs}(\vec{x})$ [~~)~~] which is a function of the recorded traces that **have** each [~~has~~] been given a weight $w_i(\vec{x})$;

b) said computer program means including means for enabling a computer to interpret $P_{Obs}(\vec{x})$ to find the spatial positions of **the** reflectors in the subsurface, and based on these reflectors and the seismic velocities a depth model is established in the computer, [~~and one of the reflectors~~] **wherein one of the reflector surfaces** in the depth model is chosen to be the target reflector;

c) said computer program means including means for enabling a computer to

compute synthetic traces from the target reflector from all shot/receiver pairs [~~in the survey that was used in a);~~

~~d) said computer program means including means for enabling a~~] **by programming the** computer to set the RC of the target reflector in the depth model to an essentially constant value when the synthetic traces are computed;

d) [~~e)~~] said computer program means including means for enabling a computer to perform a local PSDM of the **computed** synthetic traces in a band around the target reflector to obtain a modeled **synthetic** PSDM cube $P_{Mod}(\vec{x})$ **locally around the target reflector**; and

e) [~~f)~~] said computer program means including means for enabling a computer to measure the amplitudes along **the** target reflector [~~on~~] **from** the real PSDM cube $P_{Obs}(\vec{x})$, **and** dividing these **amplitude** measurements [~~with~~] **by** the corresponding **amplitude** measurements from the modeled PSDM cube $P_{Mod}(\vec{x})$, [~~obtaining an estimate~~] **to thereby obtain discrete estimates** of the angle dependent RC [~~with corresponding reflection angle~~] **for all illuminated areas of the target reflector** and **a** weight function **for all discrete estimates of the RC along the target reflector**.

Claims 8 to 12 *(cancelled)*

13. (*currently amended*):The method according to claim 1, wherein the RC in [~~d)~~] **c)** is set to 1.0 in the calculation of the synthetic traces.

14. (*currently amended*):The method according to claim 1, wherein the same weights $w_i(\vec{x})$ in the PSDM in a) are used in the local PSDM in [~~e)~~] **d)**.

15. (*currently amended*):The method according to claim 1, wherein "square" method or "norm" method is used for measuring the amplitudes in [~~f~~] **e)**.

16. (*currently amended*):The method according to claim 1, wherein [~~the process in a) f) is~~] **steps a) to e) are** repeated for points along the target reflector to create a map of the RC [~~for the target reflector~~] **with corresponding angles**.

17. *(previously submitted):*The method according to claim 1, wherein the synthetic traces in c) are computed by ray tracing.

18. (*currently amended*):The computer program according to claim 7, wherein the RC in [~~d~~)] **c)** is set to 1.0 in the calculation of the synthetic traces.

19. (*currently amended*):The computer program, according to claim 7, wherein the weights $w_i(\vec{x})$ in the PSDM in a) are used in the local PSDM in [~~e~~)] **d)** .

20. (*currently amended*):The computer program according to claim 7, wherein the "square" method or "norm" method is used for measuring the amplitudes in [~~f~~)] **e)**.

21. (*currently amended*):The computer program according to claim 7, wherein the [~~process in a) f~~)] **program means in a) to e)** is repeated for points along the

target reflector to make a map of the RC for the target reflector.

22. *(previously submitted):* The computer program according to claim 7, wherein the synthetic traces in c) are computed by ray tracing.

23. *(currently amended):* A data set representing the Reflection Coefficient (RC) of **illuminated areas of** subsurface reflectors produced by

a) migrating to depth recorded traces in a survey by Pre-Stack Depth Migration (PSDM), using shot/receiver pairs, [~~thereby achieving~~] **to obtain** a real depth migrated seismic cube $P_{Obs}(\vec{x})$ which is a function of the recorded traces that have each been given a weight $w_i(\vec{x})$;

b) interpreting $P_{Obs}(\vec{x})$ to find the spatial positions of the reflectors in the subsurface, and based on these reflectors and the seismic velocities, a depth model is established in the computer, **wherein one of the reflector surfaces** [~~and one of the reflectors~~] in the depth model is chosen to be the target reflector;

c) computing synthetic traces from the target reflector for all shot/receiver pairs **by** [~~in the survey that was used in a);~~]

[~~d)~~] setting the RC of the target reflector in the depth model to an essentially constant value when the synthetic traces are computed;

d) [~~e) doing~~] **performing** a local PSDM of the **computed** synthetic traces in a band around the target reflector to obtain a modeled **synthetic** PSDM cube $P_{Mod}(\vec{x})$ **locally around the target reflector**; and

e) [~~f~~] measuring the amplitudes along the target reflector [~~on~~] **from** the real PSDM cube $P_{Obs}(\vec{x})$, and dividing these **amplitude** measurements by the corresponding **amplitude** measurements from the modeled PSDM cube $P_{Mod}(\vec{x})$, to [~~thereby obtain an estimate~~] **obtain discrete estimates** of the angle dependent RC **for all illuminated areas of the target reflector** [~~with corresponding reflection angle~~] and **a** weight function **for all discrete estimates of the RC along the target reflector**.

24. *(currently amended):* The data set according to claim 23, wherein **the** RC in [~~d~~)] **c)** is set to 1.0 in the calculation of the synthetic traces.

25. *(currently amended):* The data set according to claim 23, wherein the same weights $w_i(\vec{x})$ in the PSDM in a) are used in the local PSDM in [~~e~~)] **d)**.

26. *(currently amended):* The data set according to claim 23, wherein "square" method or "norm" method is used for measuring the amplitudes in [~~f~~)] **e)**.

27. *(currently amended):* The data set according to claim 23, wherein [~~the process in a) f) is~~] **steps a) to e) are** repeated for points along the target reflector to create a map of the RC [~~for the target reflector~~] **with corresponding angles**.

28. *(previously submitted):* The data set according to claim 23, wherein the synthetic traces in c) are computed by ray tracing.

29. *(previously submitted):* A map produced by multidimensional plotting of the data set according to claim 23.